

MONTHLY WEATHER REVIEW.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for June, 1903, is based on data from about 3300 stations, classified as follows:

Weather Bureau stations, regular, telegraph and mail, 160; West Indian Service, cable and mail, 8; River and Flood service, 52, river and rainfall, 177, rainfall only, 62; voluntary observers, domestic and foreign, 2565; total Weather Bureau Service, 2962; Canadian Meteorological Service, by telegraph and mail, 20, by mail only, 13; Meteorological Service of the Azores, by cable, 2; Meteorological Office, London, by cable, 8; Mexican Telegraph Company, by cable, 3; Army Post Hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Company, 96; Hawaiian Meteorological Service, 75; Jamaica Weather Service, 130; Costa Rican Meteorological Service, 25; The New Panama Canal Company, 5; Central Meteorological Observatory of Mexico, 20 station summaries, also printed daily bulletins and charts, based on simultaneous observations at about 40 stations; Mexican Federal Telegraph Service, printed daily charts, based on about 30 stations.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Territorial Meteorologist, Honolulu, H. I.; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; Lieut. Commander W. H. H. Southerland, Hydrographer, United States Navy; H. Pittier, Director of the Physico-Geographic Institute, San José,

Costa Rica; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. M. Shaw, Esq., Secretary, Meteorological Office, London; Rev. Josef Algué, S. J., Director, Philippine Weather Service; and H. H. Cousins, Chemist, in charge of the Jamaica Weather Office.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is $157^{\circ} 30'$, or $10^{\text{h}} 30^{\text{m}}$ west of Greenwich. The Costa Rican standard of time is that of San José, $0^{\text{h}} 36^{\text{m}} 13^{\text{s}}$ slower than seventy-fifth meridian time, corresponding to $5^{\text{h}} 36^{\text{m}}$ west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

Barometric pressures, whether "station pressures" or "sea-level pressures," are now reduced to standard gravity, so that they express pressure in a standard system of absolute measures.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

The month of June, 1903, had a remarkable record for loss of life and property by flood and storms throughout the United States.

In the lower Missouri and upper Mississippi rivers lives were lost and property to the value of millions of dollars was destroyed by floods that were second in magnitude only to the floods of June, 1844.

At St. Louis, Mo., the Mississippi River passed the danger line, 30 feet, on the 2d, and reached a stage of 38 feet on the 10th. The various stages at that point were accurately forecast for from two to four days in advance.

A full description of the floods referred to, the damage they caused, and the action taken by the Weather Bureau in issuing warnings in connection therewith, will be found under the heading "Rivers and floods."

During the early days of the month heavy rains caused freshets in the east Gulf and South Atlantic States, and at points in Arkansas the Arkansas River was from 1 to 2 feet above the danger line. In the north Pacific coast States high temperatures and a great amount of snow in the mountains furnished conditions favorable for rises in the Columbia River and tributaries.

On the 6th Pacolet, Clifton, and Glendale, S. C., were devastated by floods due to heavy rains in the mountainous watersheds of the streams of that district. Many lives were lost in and about the places named, and the property loss has been

estimated at about \$3,000,000. During the 7th and 8th the James River, Virginia, rose rapidly. On the 12th flood conditions were reported in the Delaware River at Port Jervis, N. Y., and in the Raritan Valley, New Jersey.

On the 14th torrential rains in a range of hills south of Heppner, Oreg., caused a rush of water down the bed of Willow Creek, in which the town is located, drowning about 200 persons and destroying property to the estimated value of \$250,000.

High water, due to melting snow in the upper headwaters of the Rio Grande River and heavy rain in northern New Mexico, was reported in the Rio Grande River, in New Mexico, and western Texas on the 14th and 15th. On the 18th the Rio Grande reached a maximum stage at San Marcial, N. Mex., where the water was several feet deep in the lower portion of the town.

On the 28th and 29th heavy rains fell in localities in the Middle Atlantic States.

A period of rainy weather that set in on the 7th and continued intermittently during the balance of the month broke a drought that had prevailed in the Middle Atlantic and New England States for nearly two months, and extinguished destructive forest fires that were raging in the Catskills, Adirondacks, and White mountains.

On the 1st a tornadic storm struck Gainesville, Ga., killing or fatally injuring more than 100 persons, and destroying property to the value of about \$500,000.